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(54) **Marine escape suit**

(57) Adjustment apparatus for a maritime escape suit comprising an adjustment strap (8,30), and two respective anchor points (14,16,32A) for fixing to an escape suit, the strap (8,30) being securable to the anchor points (14,16,32A) and being arranged to constrain the anchor points (14,16,32A) to define a predetermined maximum distance between them, the maximum distance being variable whereby a reduction in the maximum distance causes an effective reduction in the size of an escape suit to which the anchor points (14,16,32A) are fixed.

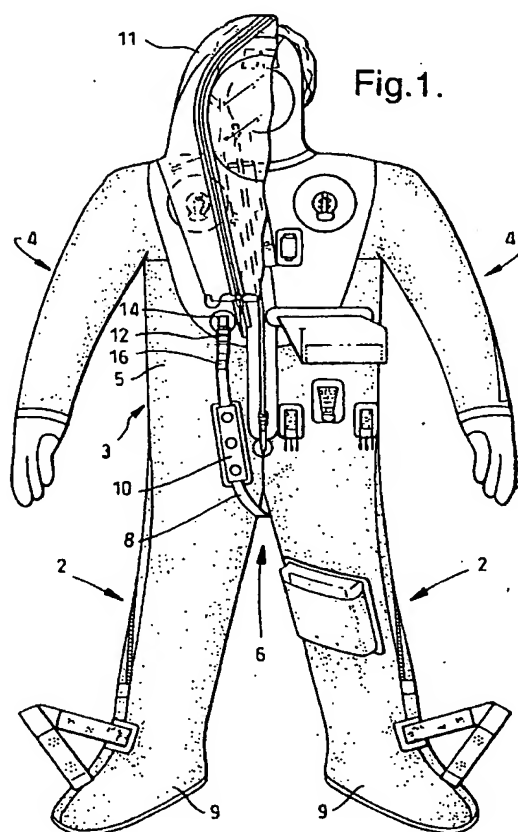


Fig.1.

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Description

[0001] The invention relates to a marine escape suit such as a suit of the kind used to escape from a submarine structure.

[0002] Such suits are typically manufactured only in one size. That size must be sufficiently large to accommodate the largest person that it can be envisaged would use the suit. Thus, for smaller persons, it may be difficult to put on and cumbersome to wear. There is also the risk that excess material will snag during escape.

[0003] According to a first aspect of the invention, there is provided a marine escape suit including a body portion, arm portions and leg portions for receiving the body, arms and legs of a wearer respectively, dimension of at least one of said portions being adjustable to accommodate variations in the dimensions of the parts of the body of the wearer received by said portions.

[0004] The following is a more detailed description of the invention, by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a front view of a marine escape suit with a hood of the suit partially folded away,

Figure 2 is a view of a portion of a left leg of the suit of Figure 1 adjusted to have a reduced length,

Figure 3 is a rear view of the suit of Figure 1,

Figure 4 is a schematic view of means for adjusting the length of the leg of the suit of Figures 1 to 3,

Figure 5 is a schematic view of part of a crotch adjustment for the suit of Figures 1 to 4,

Figure 6 is a schematic view of a strap and an anchor point for the crotch adjustment of Figure 5, and

Figure 7 is a schematic view of a buckle for use in the crotch adjustment of Figure 6.

[0005] With reference to Figure 1, an escape suit has legs 2, arms 4 and a crotch region 6. It also has a body portion 3 with a rear panel 5 and a front panel 7. The suit also includes feet 9 and a hood 11 covering the head of a wearer. The suit may be made of any suitable foldable material.

[0006] An adjustment strap 8 is connected at one end by stitching 17 to an anchor point 18 on the rear panel 5 of the suit (see Figure 6). It then passes through a rear guide 20, under a crotch region 6 between the legs 2, before passing through a front guide 10 and connecting to a buckle 12 having a webbing tongue 13 connected by stitching 15 to an anchor point 14 fixed to the front panel 5 (see Figure 7). A free end 16 of the strap 8 extends beyond the buckle 12.

[0007] The front and rear guides 10,20 (seen in Figure

5) each comprise a rectangular panel 21 fixed to the suit and a perforate strip 23 overlying the panel and stitched to the panel 21 only along its longitudinal edges. This forms a guide slot between the strip 23 and the panel 21 through which the strap 8 passes. This ensures that the strap 8 is not loose and free to snag.

[0008] As shown in Figures 1 and 3, the strap 8 has its maximum length so giving the suit its maximum dimension between the crotch region 6 and the anchor points 14,18. By pulling on the free end 16 of the strap 8, the length of the strap 8 between the anchor points 14,18 is shortened and the distance between the crotch region 6 and the anchor points is also shortened. The material of the body portion is thus gathered up by the strap 8. Thus persons with differing torso lengths can adjust the dimension of this portion of the suit by use of the strap 8. It can be lengthened by releasing the buckle 12.

[0009] The suit is also adjustable in each leg 2. The leg adjustment is provided automatically. Each leg 2 carries an elastic strap 31 (see Figure 4) which extends along an outer side of the associated leg from a point adjacent a waist of the suit to a point adjacent the associated foot 7. The elastic strap 31 thus extends parallel to the length of the leg 2.

[0010] The elastic strap 31 passes through a perforate guide 30 constructed similarly to the crotch guides 10,20. The guide 30 (as seen in Figure 4) has a panel 40 overlaid with a strip 42. The panel 40 is stitched to the suit using stitching 44. The strip 42 is stitched to the panel 40 only along its longitudinal side edges. The elastic strap 31 passes between the panel 40 and the strip 42 and emerges at each end of the strip 42. Each end of the strap 31 carries a female part 32A of a snap-press stud connection 32. Each connection 32A snap-fits with a complementary male connector 32B at a respective end of the guide 30. The strip 42 is perforated by regularly spaced circular apertures to allow compression of the leg 2 longitudinally (in a direction along arrow A) as shown in Figure 2.

[0011] When a large person wears the suit, the elastic strap 31 is stretched to its fullest extent and allows the suit to expand in the leg 2 to accommodate such a person's leg. The maximum expansion is limited by the length of the strip 42, although the upper press-stud 32 can be released so that the strap has no constraining effect - when the maximum expansion is limited by the material of the leg 2. Of course, the length of these parts may be the same. Where the wearer's leg is less than the maximum length, the elastic strap 31 gathers up the material of the legs 2 in the portion of the leg 2 spanned by the strap 31 between the waist and the associated foot 7 to reduce this dimension. The minimum leg length is shown in Figure 2.

[0012] It will be appreciated that the perforations in the guide 30 need not be provided by the regularly spaced circular apertures 34 described above. The apertures may be omitted or the guide may be cut away in

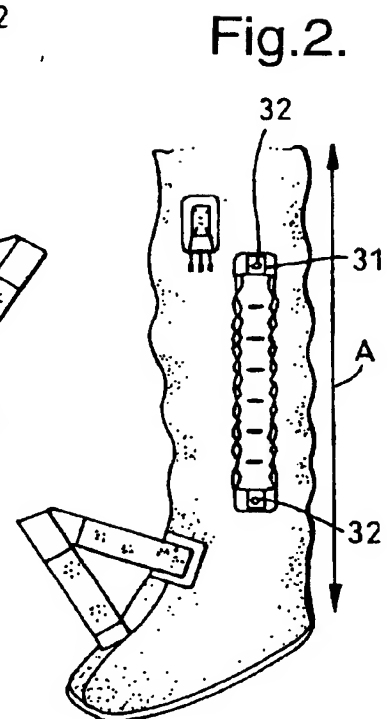
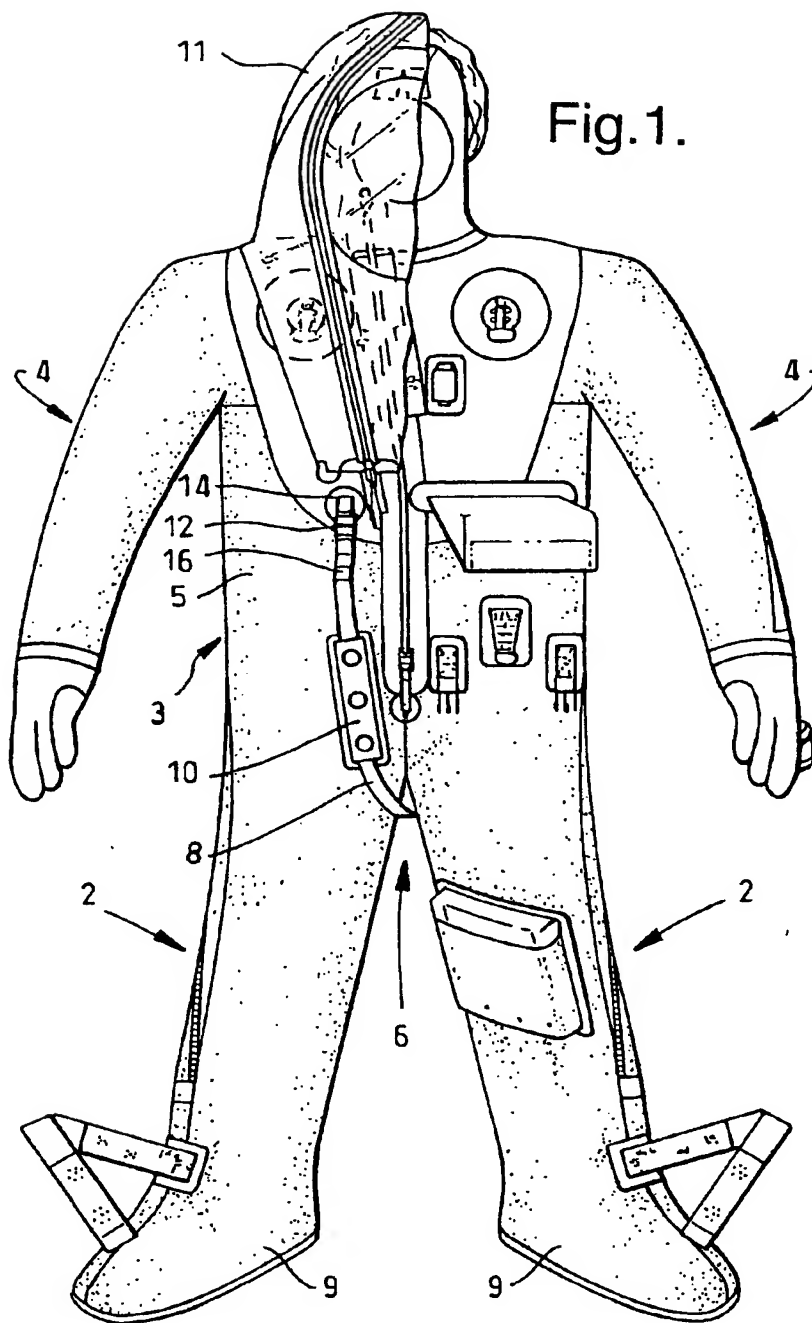
some other manner that facilitates gathering up along with the suit material.

[0013] It will also be appreciated that there may be automatic adjustment of the arms 4 in a similar way to the automatic adjustment of the legs 2 described above. Further, other parts of the suit may be similarly adjustable. For example, the width of the suit across the chest may be so adjustable and even the circumference of the suit around the legs and arms. The waist dimension may also be similarly adjusted. These various adjustments may be provided separately or together.

Claims

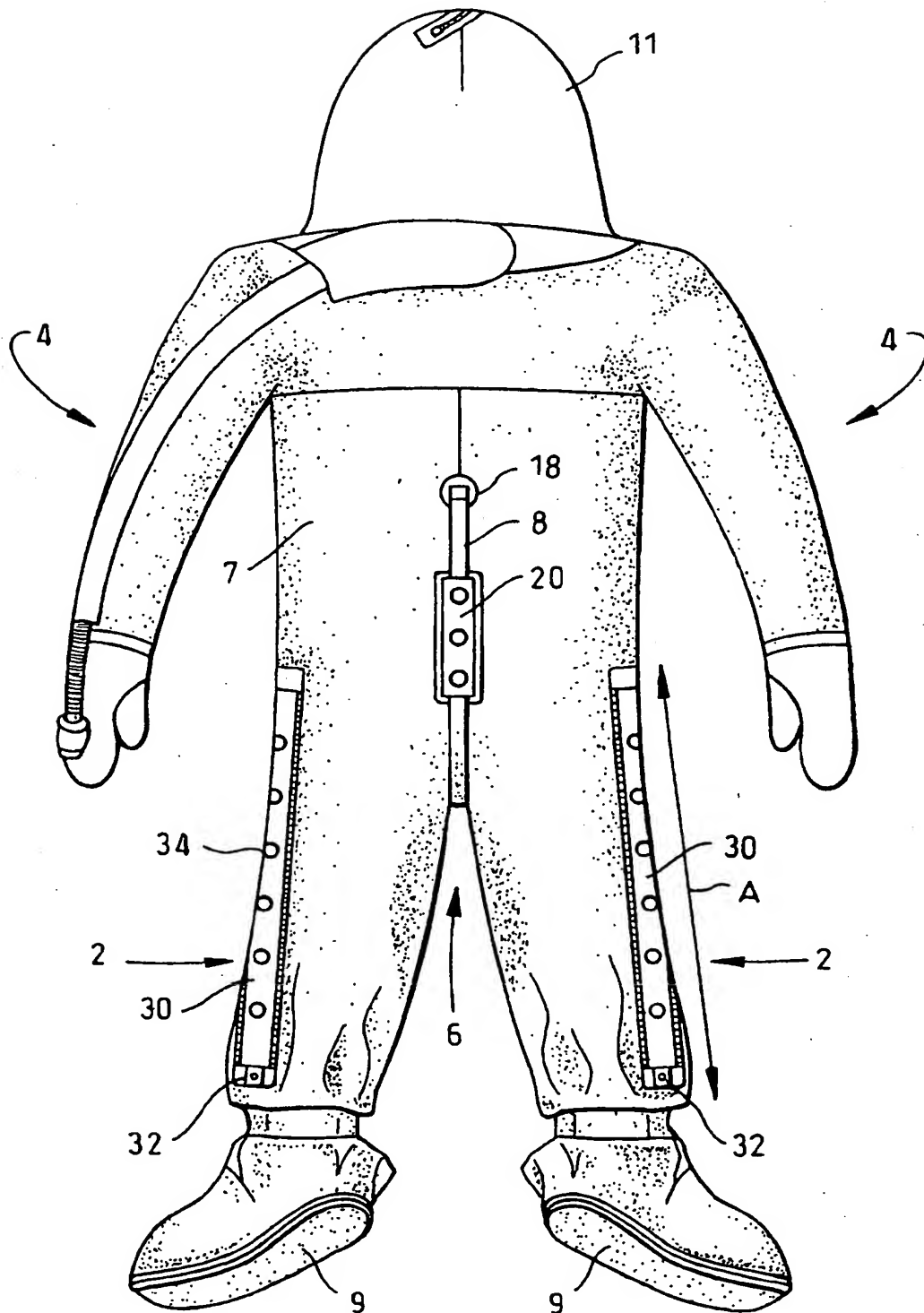
1. A marine escape suit including a body portion, arm portions and leg portions for receiving the body, arms and legs of a wearer respectively, a dimension of at least one of said portions being adjustable to accommodate variations in the dimensions of the part of the body of the wearer received by said portion.
2. A suit according to claim 1 wherein the suit portion with the adjustable dimension includes a member having a length that is variable to adjust the dimension of the associated body portion.
3. A suit according to claim 2 wherein the member is elastic to gather the suit portion to a minimum dimension, said suit portion being extended against the action of the member by insertion into the suit portion of a body portion larger than said minimum dimension.
4. A suit according to claim 3 wherein the elastic member comprises a strap having a first end and a second end, the first and second ends being connected to respective points on the associated suit portion such that when the elastic strap is not fully extended, the part of the suit between the first and second ends is gathered up.
5. A suit according to claim 4 wherein the elastic strap is accommodated within a guide carried by the associated suit portion.
6. A suit according to claim 5 wherein the guide comprises a panel overlaid with a strip, the base panel and the strip patch forming between them a guide through which passes the elastic strap.
7. A suit according to claim 6 wherein the first and second ends of the elastic strap are connected to the associated suit portion by two releasable connectors, each releasable connector being at a respective one of the first and second ends of the elastic strip.

8. A suit according to claim 7 wherein said connectors are snap-fit connectors.
9. A suit according to any one of claims 3 to 8 wherein said elastic member is provided on a leg portion of the suit.
10. A suit according to claim 9 wherein said elastic strip extends in a direction parallel to the length of the associated leg portion.
11. A suit according to claim 2 wherein said member is an inextensible member connected between first and second fixed points on the associated suit portion, the length of the member between said first and second fixed points being adjustable to adjust the dimension of the associated suit portion.
12. A suit according to claim 11 wherein the member comprises a strap having a first end and a second end, the first end being fixed to the first fixed point on the associated suit portion and a second end passing through a buckle at the second fixed point, the buckle allowing the length of the strap between the first and second fixed points to be adjusted.
13. A suit according to claim 11 or claim 12, wherein the first fixed point is on a rear panel of the body portion of the suit and the second fixed point is on a front panel of the body portion of the suit, with the strap passing between the leg portions of the suit adjacent a crotch area of the suit, adjustment of the length of the strap adjusting the dimension of the suit between the first and second fixed points and the crotch of the suit.
14. A suit according to any one of claims 11 to 13 wherein the strap passes through at least one guide formed on the associated suit portion.
15. A suit according to claim 14 when dependent on claim 13 wherein the strap passes through a first guide on the back panel and a second guide on the front panel.
16. A suit according to claim 14 or claim 15 wherein the or each guide comprises a panel stitched to the associated suit portion and overlaid by a strip to form therebetween a guide through which the strap passes.
17. A suit according to claim 6 or claim 16 wherein the strip is perforate.

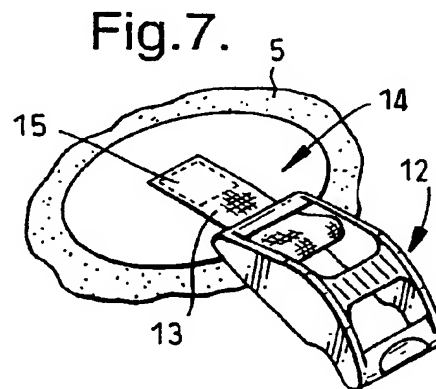
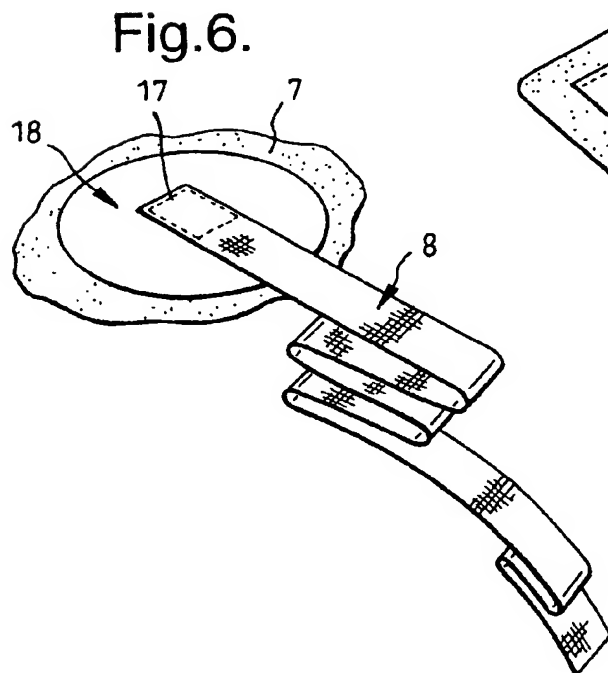
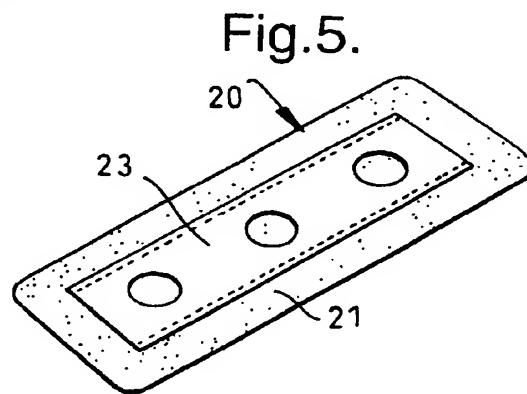
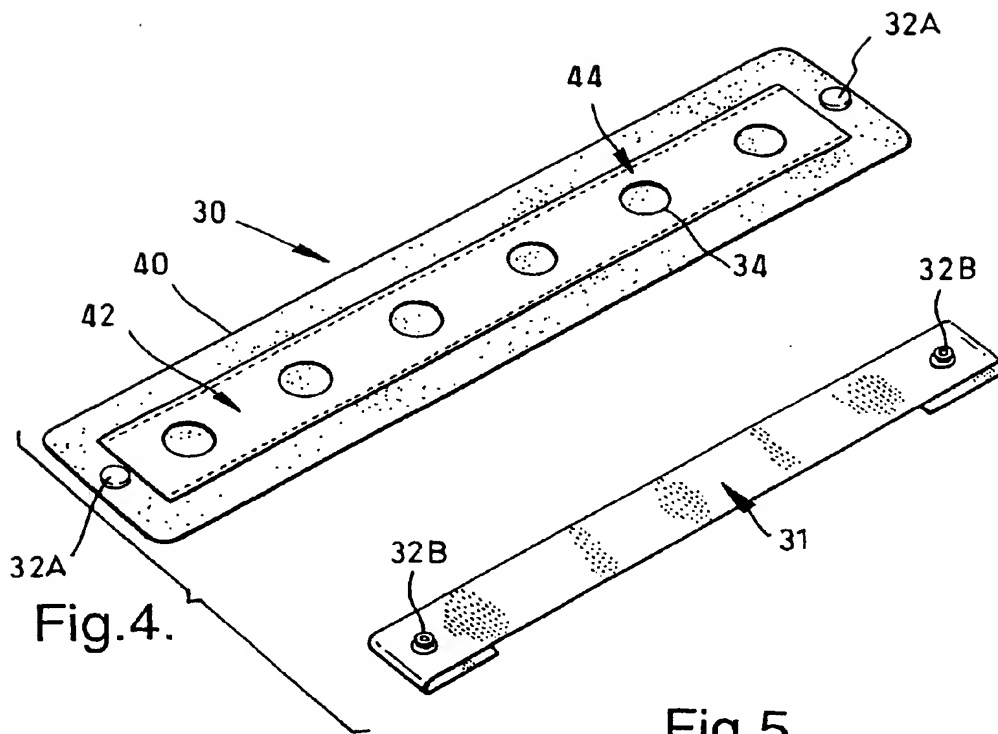


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Fig.3.



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(30) Priority: 07.10.1998 GB 9821878

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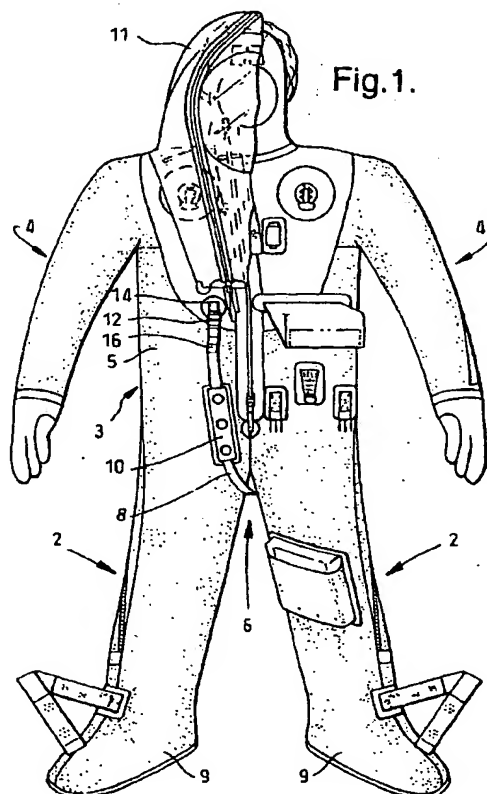


Fig.1.

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EUROPEAN SEARCH REPORT

Application Number
EP 99 30 7909

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A			
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 February 2001	Examiner Häusler, F.U.
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document	

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Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
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A	US 4 910 802 A (MALLOY EUGENE A) 27 March 1990 (1990-03-27) * abstract; figures * * column 3, line 30 - line 59 * * column 3, line 67 - column 4, line 17 *	1-5,9,10	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 February 2001	Examiner Häusler, F.U.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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07-02-2001

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